FOUNDATION INVESTIGATION

PROPOSED MALA EKENA PROJECT

HONOLULU, HAWAII

TMK: 1-7-19: 21
1-7-20: 16 & 50

for

AMFAC FINANCIAL CORP.

W. O. 287

January 24, 1975

EH

ERNEST K. HIRATA & ASSOCIATES, INC.

EH

ERNEST K. HIRATA & ASSOCIATES, INC.

Soils and Foundation Engineering

1236 South King Street • Honolulu, Hawaii 96814 • Phone 531-5733

January 24, 1975
W. O. 287

Amfac Financial Corp.
700 Bishop Street - 16th Floor
Honolulu, Hawaii 96813

Attention: Mr. Kenneth Matsuura

Gentlemen:

Our report, "Foundation Investigation, Proposed Mala Ekena Project, Honolulu, Hawaii, TMK: 1-7-19: 21 and 1-7-20: 16 & 50", dated January 24, 1975, our Work Order 287 is enclosed. This is the report requested by you and planned in cooperation with personnel of Wong, Wong & Peng, Inc., Architects, and T. Y. Lin, Hawaii, Inc., Structural Engineers.

In general, the surface soil consists of a grayish brown silty clay underlain by basalt. Between the two areas delineated as rock outcrop, the underlying soil consisted of silty gravels with numerous cobbles and boulders.

Since subsurface conditions vary, design of foundations should include alternate designs for areas where basalt is not encountered. We recommend conventional spread footings founded on basalt. In areas along the stream bed, mat or strip type footings are recommended. Recommendations are presented in this report for the design of both foundation types.

We appreciate this opportunity to be of service. Should you have any questions concerning this report, please feel free to call on us.

Very truly yours,

Ernest K. Hirata & Associates, Inc.

Ernest K. Hirata

Ernest K. Hirata President

EKH:yk

FOUNDATION INVESTIGATION
PROPOSED MALA EKENA PROJECT
HONOLULU, HAWAII

TMK: 1-7-19: 21
1-7-20: 16 & 50

INTRODUCTION

This report presents the results of our foundation investigation performed on the subject property. The purpose of this investigation was to determine the nature of the soils underlying the site, to ascertain their engineering properties, and to provide recommendations for foundation design, floor slabs, lateral pressures, and site preparation.

This investigation included drilling ten exploratory test borings, obtaining representative soil samples, laboratory testing and analysis, and the preparation of this report. The exploratory boring locations are shown on the enclosed Grading Plan. Also attached is an Appendix which describes the laboratory testing procedures.

STRUCTURAL CONSIDERATIONS

Information concerning the proposed development was furnished by the personnel of Wong, Wong & Peng, Inc., Architects, and T. Y. Lin, Hawaii, Inc., Structural Engineers.

The proposed development will consist of six buildings located along Puehuehu Stream. The buildings will be five to six stories in height of reinforced concrete construction. Structural loads will be transmitted to the foundations primarily by columns. Maximum column loads were not available at the time of this investigation. Excavations of 6 to 8 feet along with some embankment fills are anticipated.

SITE DESCRIPTION

The property is bordered by Stillman Lane on the Ewa end and by a portion of the City & County of Honolulu Park on the Diamond Head end. The site is located at the end of Huna Street, and Puehuehu Stream flows through the site in a southerly direction. Total relief over the site is approximately 36 feet.

At the time of our investigation, the Ishii Gardens Teahouse occupied a portion of the Diamond Head half of the site. Numerous abandoned wood frame cottages were also observed adjacent to the teahouse. Vegetation growth was moderate to heavy along the stream banks. Rock outcrops and boulders were also observed along the banks of the stream.

FIELD EXPLORATION

The site was explored from December 20th, 1974 to January 15th, 1975 by drilling ten exploratory test borings with both a truck mounted and portable drilling machines. The borings varied in depth from 10 to 21 feet. The soils were continuously logged by our field engineer and classified by visual examination in accordance with the Unified Soil Classification System. The boring locations are shown on the Grading Plan and the soils encountered are logged on Plates A1 through A10.

Undisturbed, bag, and core samples were recovered from the borings for laboratory testing. Undisturbed samples were obtained by driving a 3 inch O.D. thin-walled steel sampler with a 140 pound hammer from a height of 30 inches. Core samples were obtained by drilling with a NX core barrel. The required blow count for each six inches of penetration and recovery percentages for each core run are shown on the enclosed Boring Logs.

SOIL CONDITIONS

The soil conditions for the project site can be divided into two areas. Area I is situated on the Diamond Head side of Puehuehu Stream while Area II is on the Ewa side of the stream. The delineation of rock outcrops for both areas is plotted on the Grading Plan.

Area I

The surface soil consists of a grayish brown silty clay in a firm condition varying in thickness from 0.5 to 5.5 feet. Borings B4 and B5 encountered fill consisting of silty clays with mixtures of sand and coral fragments.

Underlying the surface soil was basalt of varying hardness. Borings B2, B3, B5, and B6 encountered gray hard basalt which will require blasting. The basalt encountered in borings B1 and B4 were fractured and could probably be excavated with heavy equipment.

Boring B7 was drilled within the stream bed, and the soils consisted of silty gravels with numerous cobbles and boulders down to the maximum depths drilled.

Groundwater was encountered in boring B3 at a depth of 11.5 feet below existing ground.

<u>Area II</u>

The surface soils in Area II, located on the Ewa side of Puehuehu Stream, consist of a grayish brown silty clay ranging in thickness from 4.5 to 6.5 feet. Borings B8 and B9 encountered silty gravels with numerous cobbles and boulders to depths of 12 to 13 feet below existing ground. Basalt was encountered in boring B10 underlying the silty clay.

Plates 1 and 2 present a cross section of the approximate subsurface soil conditions underlying the site.

CONCLUSIONS AND RECOMMENDATIONS

General

Since the proposed buildings will be situated over portions of the former stream bed, design of the foundations should include alternate designs for areas where basalt is not encountered.

AREA I

For Area I, where borings B1 through B6 were drilled, foundations may be designed using conventional spread footings founded on basalt. The delineation of the rock outcrop indicates areas where basalt will probably be encountered.

It should be noted that the location where boring B1 was drilled is at the top of bank, and any footings located below that point will probably be founded on silty gravels and cobbles.

Foundations for Building "B" located below the rock outcrop will require mat or strip type footings founded on the silty gravels and cobbles.

AREA II

For foundations located above the rock outcrop, conventional spread footings founded on basalt may be used. For foundations located below the rock outcrop, mat or strip type footings will be required founded on the silty gravels and cobbles.

Foundations

Conventional spread footings may be used in areas where basalt will be encountered. Column footings may be designed for a bearing value of 5000 pounds per square foot founded on the hard basalt.

Mat or strip type footings should be designed for areas where basalt is not encountered. Foundations may be designed for a bearing value of 2000 pounds per square foot.

All foundations should be founded either on the basalt or silty gravel stratum, and in no case should any foundations rest on the surface layer of silty clays.

For foundations resting on the silty gravels, recompaction of the bottom of excavations may be necessary. In addition, up to 12 inches of granular material may be required if soft areas are encountered.

Lateral Design

The bearing values indicated above are for the total of dead and frequently applied live loads, and may be increased by one-third for short duration loading which includes the effect of wind or seismic forces. Resistance to lateral loading may be provided by friction acting at the base of foundations and by passive earth pressure. An allowable coefficient of friction of 0.4 may be used with the dead load forces. Passive earth pressure may be computed as an equivalent fluid having a density of 300 pounds per cubic foot with a maximum earth pressure of 3000 pounds per square foot. When combining passive and friction for lateral resistance, the passive component should be reduced by one-third.

For active earth pressure considerations, an equivalent fluid pressure of 50 pounds per cubic foot per foot of depth should be used.

Foundation Settlement

Settlement of the foundation system is expected to occur on initial application of loading. Differential settlement is not expected to exceed 1/4 inch.

Retaining Walls

For design of retaining walls, an active equivalent fluid pressure of 50 pounds per cubic foot per foot of depth should be used. In addition, hydrostatic pressure buildup may be possible with sudden drops of the stream level. We recommend that an additional equivalent fluid pressure of 63 pounds per cubic foot be used for design, beginning at a point one half the height of the wall from the location of the weeper holes.

Floor Slabs

For any slabs on grade resting on basalt, we recommend a four inch cushion of crushed rock to be placed beneath the slab.

In areas where the slab on grade rests on the silty clay stratum, we recommend the removal of the upper 24 inches of expansive silty clays and replacement with compacted nonexpansive granular material.

Site Preparation

For areas where structural fill will be required, we recommend removal of all vegetation. The surface should then be scarified to a depth of six inches and recompacted to a minimum of 90 percent relative compaction. Any fills placed on slopes exceeding slope gradients of 5:1 (horizontal to vertical) shall be properly keyed and benched. Any imported material used for structural fill shall be approved by us prior to use in the compacted fills.

Inspection

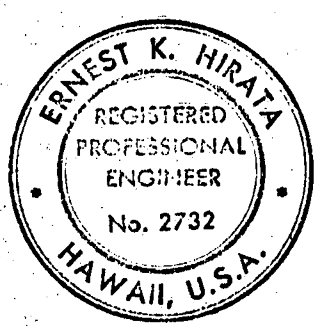
It is recommended that all footing excavations be inspected by a qualified foundation engineer prior to placing concrete or steel. Any structural fill which is placed should be inspected and tested.

Limitations

The boring logs indicate the approximate subsurface soil conditions encountered only at those locations where the borings were made, and may not represent conditions at other locations.

During construction, should subsurface conditions differ from those encountered in the borings, we should be advised immediately in order to review and to revise our recommendations.

Our professional services were performed, findings obtained, and recommendations prepared in accordance with generally accepted engineering practices. This warranty is in lieu of all other warranties expressed or implied.



Respectfully submitted,

Ernest K. Hirata & Associates, Inc.

Ernest K. Hirata P.E. 2732

EKH:yk

Enc: Appendix of Laboratory Testing
Boring Logs — Plates A1 through A10
Consolidation Tests — Plate B
Cross Sections — Plates 1 and 2
Grading Plan

APPENDIX OF LABORATORY TESTING

Classification

The field classification is verified in the laboratory, also in accordance with the Unified Soil Classification System. Laboratory classification is determined by both visual examination and Atterburg Limit Tests according to ASTM D423 and D424. The final classification is shown on the Boring Logs.

Moisture-Density

The field moisture content and dry unit weight are determined for each of the undisturbed soil samples. The information is useful in providing a gross picture of the soil consistency between borings and any local variations. The dry unit weight is determined in pounds per cubic foot while the moisture content is determined as a percentage of the dry unit weight. These samples are obtained from a 3" O.D. split tube sampler.

Consolidation

Settlement predictions of the soil's behavior under load are made on the basis of the consolidation tests. Loads are applied in several increments in a geometric progression, and the resulting deformations are recorded at selected time intervals. Porous stones are placed in contact with the top and bottom of each specimen having an inside diameter of 2.40 inches and a height of 1 inch to permit addition and release of pore fluid. Results of undisturbed and remolded samples are plotted on the Consolidation Test Report.

Compaction Tests

Compaction tests were performed on bag samples to determine the optimum moisture content at which each type of proposed fill material compacts to 100% density. The tests were performed according to ASTM D-1557-70.

Swell Tests

Swell tests were performed to determine the expansiveness of the onsite surface soils. The tests were performed on undisturbed ring and remolded samples taking a one inch high specimen under different surcharge loads.

Shear Tests

Shear tests are performed in the Direct Shear Machine which is of the strain control type. The rate of deformation is approximately 0.03 inches per minute. Each sample is sheared under varying confining loads in order to determine the Coulomb shear strength parameters, cohesion and angle of internal friction. Eighty percent of the ultimate value is taken to determine the shear strength parameters.

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BORING LOG

BORING NO. B1 DRIVING WT. 140 lb. DATE OF DRILLING 12-30-74

SURFACE ELEV. 30.5± DROP 30 in. W.O. 287

DEPTH FEET	CORE	BAG	PENETRATION RESIST. BLOWS/6 inches	DRY DENSITY PCF	MOISTURE CONTENT %	RELATIVE COMPACTION %	DIRECT SHEAR STRENGTH PARAMETERS Ø	c	CLASSIFICATION (% Sand, % Silt, % Clay)
0									Silty CLAY (CH)-Grayish brown, moist, firm, with roots, cobbles.
									BASALT-Gray, hard. Begin NX coring from 1 foot.
5									80% Recovery from 1 to 2.5 feet. Hard basalt. 100% Recovery from 2.5 to 6.5 feet. Hard basalt.
10									DECOMPOSED ROCK-Orange-brown, hard. 7% Recovery from 6.5 to 10.5 feet. Decomposed rock and basalt fragments with silt. 85% Recovery from 10.5 to 14.5 feet. Hard decomposed rock.
15									End boring at 14.5 feet.
20									
25									
30									

Plate A1

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BORING LOG

BORING NO. B2 DRIVING WT. 140 lb. DATE OF DRILLING 12-27-74

SURFACE ELEV. 39± DROP 30 in. W. O. 287

DEPTH FEET	CORE	BAG	PENETRATION RESIST. BLOWS/6 inches	DRY DENSITY PCF	MOISTURE CONTENT %	RELATIVE COMPACTION %	DIRECT SHEAR STRENGTH PARAMETERS Ø	C	CLASSIFICATION (% Sand, % Silt, % Clay)
0									Silty CLAY (CH)-Grayish brown, moist, firm, with roots, cobbles and boulders. Begin NX coring from 1 foot. 92% Recovery from 1 to 5 feet. Boulder from 1 to 2 feet.
5									BASALT-Gray, hard. 98% Recovery from 5 to 10 feet. Hard basalt. 100% Recovery from 10 to 15 feet. Hard basalt.
10									
15									End boring at 15 feet.
20									
25									
30									

Plate A2

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BORING LOG

BORING NO. B3 DRIVING WT. 140 lb. DATE OF DRILLING 12-20-74

SURFACE ELEV. 49± DROP 30 in. W. O. 287

DEPTH FEET	CORE	BAG	PENETRATION RESIST. BLOWS/6 inches	DRY DENSITY PCF	MOISTURE CONTENT %	RELATIVE COMPACTION %	DIRECT SHEAR STRENGTH PARAMETERS Ø	C	CLASSIFICATION (% Sand, % Silt, % Clay)
0									Silty CLAY (CH)-Grayish brown, moist, firm, with roots and cobbles. Covered by 2" asphaltic concrete and 4" base course.
5									BASALT-Gray, hard, fractured. Begin NX coring from 3 feet. 80% Recovery from 3 to 4 feet. Highly fractured vesicular basalt. 50% Recovery from 4 to 8 feet. Fractured basalt with silt.
10 (∇ at 11.5)									100% Recovery from 9 to 10.5 feet. Fractured basalt. 100% Recovery from 10.5 to 12.5 feet. Hard basalt.
15	x		29 50/2"	66.6	57.1				33% Recovery from 12.5 to 15.5 feet. Decomposed rock with basalt fragments and silt from 13.5 feet.
20									0% Recovery from 15.5 to 16.5 feet. 100% Recovery from 17 to 21 feet. Hard basalt.
									End boring at 21 feet.
25									∇ Water level at 11.5 feet.
30									

Plate A3

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BORING LOG

BORING NO. B4 DRIVING WT. 140 lb. DATE OF DRILLING 12-23-74

SURFACE ELEV. 50± DROP 30 in. W. O. 287

DEPTH FEET	CORE	BAG	PENETRATION RESIST. BLOWS/6 inches	DRY DENSITY PCF	MOISTURE CONTENT %	RELATIVE COMPACTION %	DIRECT SHEAR STRENGTH PARAMETERS Ø	C	CLASSIFICATION (% Sand, % Silt, % Clay)
0	x		4 7 18/5.5"	67.4	43.5		34°	1.0 KSF	FILL-Silty Clay, brown, moist, firm with roots, sand, gravels, and coral fragments.
5 10 15									BASALT-Gray, hard, fractured. Begin NX coring from 4 feet. 20% Recovery from 4 to 8.5 feet. Highly fractured basalt with decomposed rock from 4.2 to 8.5 feet. 40% Recovery from 8.5 to 10.5 feet. Highly fractured basalt. 85% Recovery from 10.5 to 14.5 feet. Hard basalt. Decomposed rock from 14 feet. 100% Recovery from 14.5 to 19.5 feet. Hard basalt from 15.5 feet.
20 25 30									End boring at 19.5 feet.

Plate A4

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BORING LOG

BORING NO. B5 DRIVING WT. 140 lb. DATE OF DRILLING 12-23-74

SURFACE ELEV. 50.5± DROP 30 in. W.O. 287

DEPTH FEET	CORE	BAG	PENETRATION RESIST. BLOWS/6 inches	DRY DENSITY PCF	MOISTURE CONTENT %	RELATIVE COMPACTION %	DIRECT SHEAR STRENGTH PARAMETERS Ø	C	CLASSIFICATION (% Sand, % Silt, % Clay)
0–5.5	x		16 14 18	74.9	31.8				FILL-Silty Clay, brown, moist, firm, with sand, coral fragments and cobbles. Covered by 2" asphaltic concrete and 4" base course.
	x		42/4.5"	71.3	29.9		30°	0.2 KSF	
5.5–16.5									BASALT-Gray, hard, slightly fractured. Begin NX coring from 5.5 feet. 88% Recovery from 5.5 to 10.5 feet. Slightly fractured basalt with silt from 6 to 7 feet. Hard basalt from 7 feet. 100% Recovery from 10.5 to 14.5 feet. Hard basalt. 100% Recovery from 14.5 to 16.5 feet. Hard basalt.
									End boring at 16.5 feet.

Depth scale: 0, 5, 10, 15, 20, 25, 30

Plate A5

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BORING LOG

BORING NO. B6 DRIVING WT. 140 lb. DATE OF DRILLING 12-3-74

SURFACE ELEV. 44± DROP 30 in. W.O. 287

DEPTH FEET	CORE	BAG	PENETRATION RESIST. BLOWS/6 inches	DRY DENSITY PCF	MOISTURE CONTENT %	RELATIVE COMPACTION %	DIRECT SHEAR STRENGTH PARAMETERS Ø	C	CLASSIFICATION (% Sand, % Silt, % Clay)
0									Silty CLAY (CH)-Grayish brown, moist, firm.
									BASALT-Gray, hard, slightly fractured. Begin NX coring from 1.3 feet. 90% Recovery from 1.3 to 3.3 feet. Hard basalt, slightly fractured. 96% Recovery from 3.3 to 6 feet. Hard basalt, slightly fractured. 100% Recovery from 6 to 10 feet. Hard basalt, slightly fractured.
5									
10									End boring at 10 feet.
15									
20									
25									
30									

Plate A6

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BORING LOG

BORING NO. B7 DRIVING WT. 140 lb. DATE OF DRILLING 1-8-75

SURFACE ELEV. 30.5± DROP 30 in. W. O. 287

DEPTH FEET	CORE	BAG	PENETRATION RESIST. BLOWS/6 inches	DRY DENSITY PCF	MOISTURE CONTENT %	RELATIVE COMPACTION %	DIRECT SHEAR STRENGTH PARAMETERS ø	c	CLASSIFICATION (% Sand, % Silt, % Clay)
0–20									Silty GRAVELS (GM)-Brown, loose, river-washed, with cobbles and boulders. Covered by 4" concrete slab and 4" gravel cushion. Begin NX coring from 2.4 feet. 94% Recovery from 2.4 to 4 feet. Boulder from 2.4 to 4.5 feet. 20% Recovery from 4 to 9 feet. 12% Recovery from 9 to 14 feet. 50% Recovery from 14 to 15 feet. 24% Recovery from 15 to 20 feet.
20–30									End boring at 20 feet.

Plate A7

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BORING LOG

BORING NO. B8 DRIVING WT. 140 lb. DATE OF DRILLING 1-10-75

SURFACE ELEV. 31.5± DROP 30 in. W. O. 287

DEPTH FEET	CORE	BAG	PENETRATION RESIST. BLOWS/6 inches	DRY DENSITY PCF	MOISTURE CONTENT %	RELATIVE COMPACTION %	DIRECT SHEAR STRENGTH PARAMETERS Ø	C	CLASSIFICATION (% Sand, % Silt, % Clay)
0	x		5 6 8	67.0	56.4		36°	0.6 KSF	Silty CLAY (CH)-Grayish brown, moist, firm, with cobbles. Grading to mottled reddish orange color from 2 feet.
5									Silty GRAVELS (GM)-Brown, loose, river-washed, with cobbles and boulders. Begin NX coring from 5 feet. 47% Recovery from 5 to 6.5 feet. 100% Recovery from 6.5 to 7 feet. 79% Recovery from 8 to 10 feet. Boulder from 9 to 10 feet. 64% Recovery from 10 to 15 feet. Clay pocket from 12 to 13 feet.
15									CEMENTED CINDERS AND SILT-Orange-brown, hard.
									End boring at 15 feet.
20									
25									
30									

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BORING LOG

BORING NO. B9 DRIVING WT. 140 lb. DATE OF DRILLING 1-10-75

SURFACE ELEV. 32.0± DROP 30 in. W.O. 287

DEPTH FEET	CORE	BAG	PENETRATION RESIST. BLOWS/6 inches	DRY DENSITY PCF	MOISTURE CONTENT %	RELATIVE COMPACTION %	DIRECT SHEAR STRENGTH PARAMETERS Ø	C	CLASSIFICATION (% Sand, % Silt, % Clay)
0	x		4 23	69.0	54.3				Silty CLAY (CH)-Grayish brown, moist, firm with cobbles and boulders. Cobble at 2 feet.
	x		6 12 8/2"	73.7	47.8		UNCONFINE 2353	PSF	
5									Silty GRAVELS (GM)-Brown, loose, with cobbles and boulders. 1 foot boulder at 5 feet. Begin NX coring from 6 feet. 20% Recovery from 6 to 10 feet. 34% Recovery from 10 to 15 feet. Reddish brown sandy silt pocket from 10 to 12 feet.
10									
15									CEMENTED CINDERS AND SILT-Orange-brown, medium hard. 44% Recovery from 15 to 19.5 feet.
20									Silty GRAVELS (GM)-Orange-brown, loose, with cobbles.
									End boring at 19.5 feet.
25									
30									

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BORING LOG

BORING NO. B10 DRIVING WT. 140 lb. DATE OF DRILLING 1-15-75

SURFACE ELEV. 30.5± DROP 30 in. W.O. 287

DEPTH FEET	CORE	BAG	PENETRATION RESIST. BLOWS/6 inches	DRY DENSITY PCF	MOISTURE CONTENT %	RELATIVE COMPACTION %	DIRECT SHEAR STRENGTH PARAMETERS Ø	c	CLASSIFICATION (% Sand, % Silt, % Clay)
0									Silty CLAY (CH)-Dark brown, moist, firm with cobbles.
	x		12 12 6	75.0	53.3				Grading grayish brown color from 3 feet. Cobbles and boulders from 3.5 feet.
5	x		7 21 23/0"	67.5	54.4		UNCONFINE 2208 PSF		
									BASALT-Gray, hard, fractured. Begin NX coring from 7 feet. 77% Recovery from 7 to 10 feet. Hard basalt, slightly fractured. Clay pocket from 8.9 to 9.2 feet.
10									46% Recovery from 10 to 13.5 feet. Hard basalt, fractured. Clay pocket from 12.5 to 13.0 feet.
15									End boring at 13.5 feet.
20									
25									
30									

Plate A10

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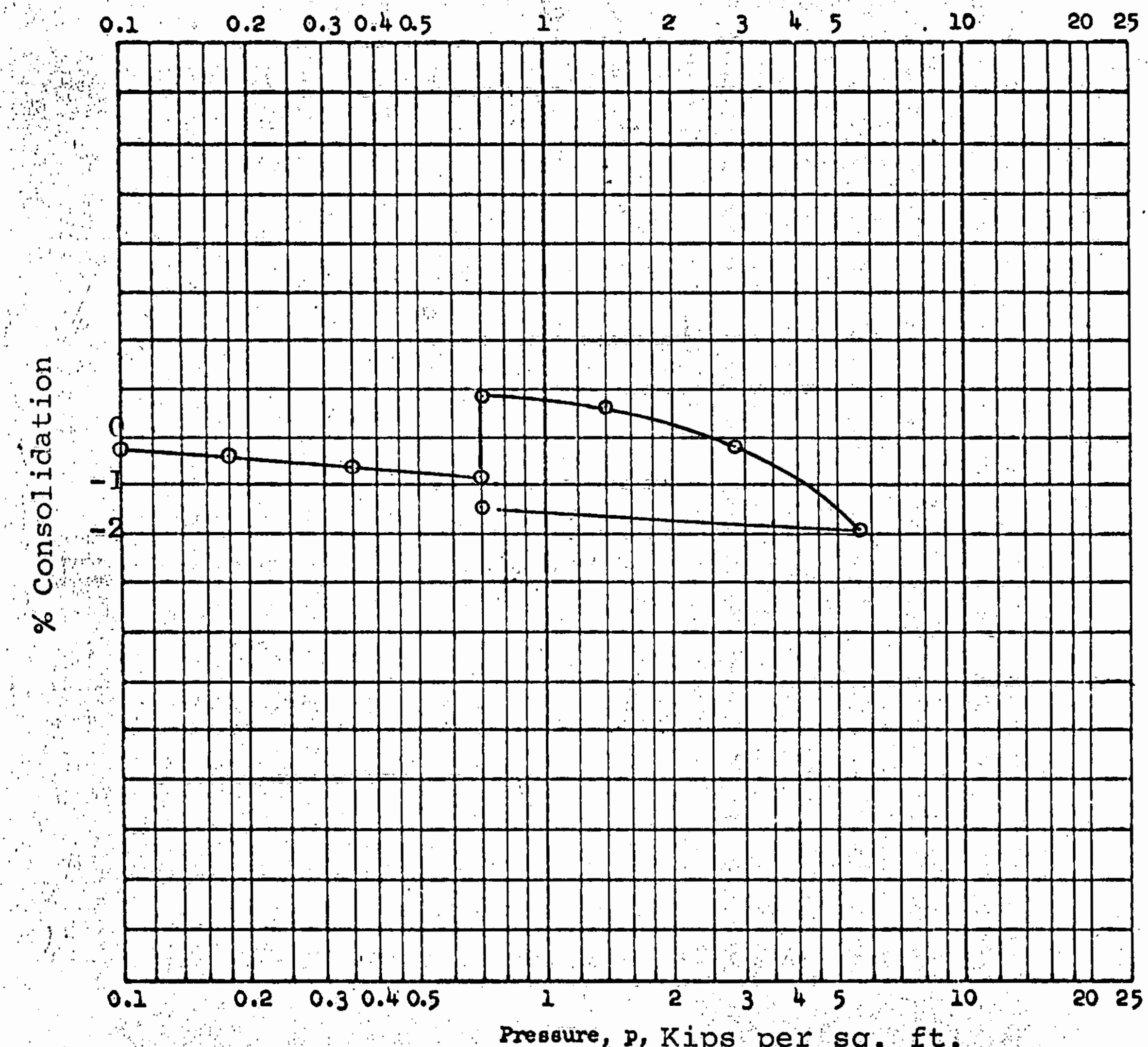
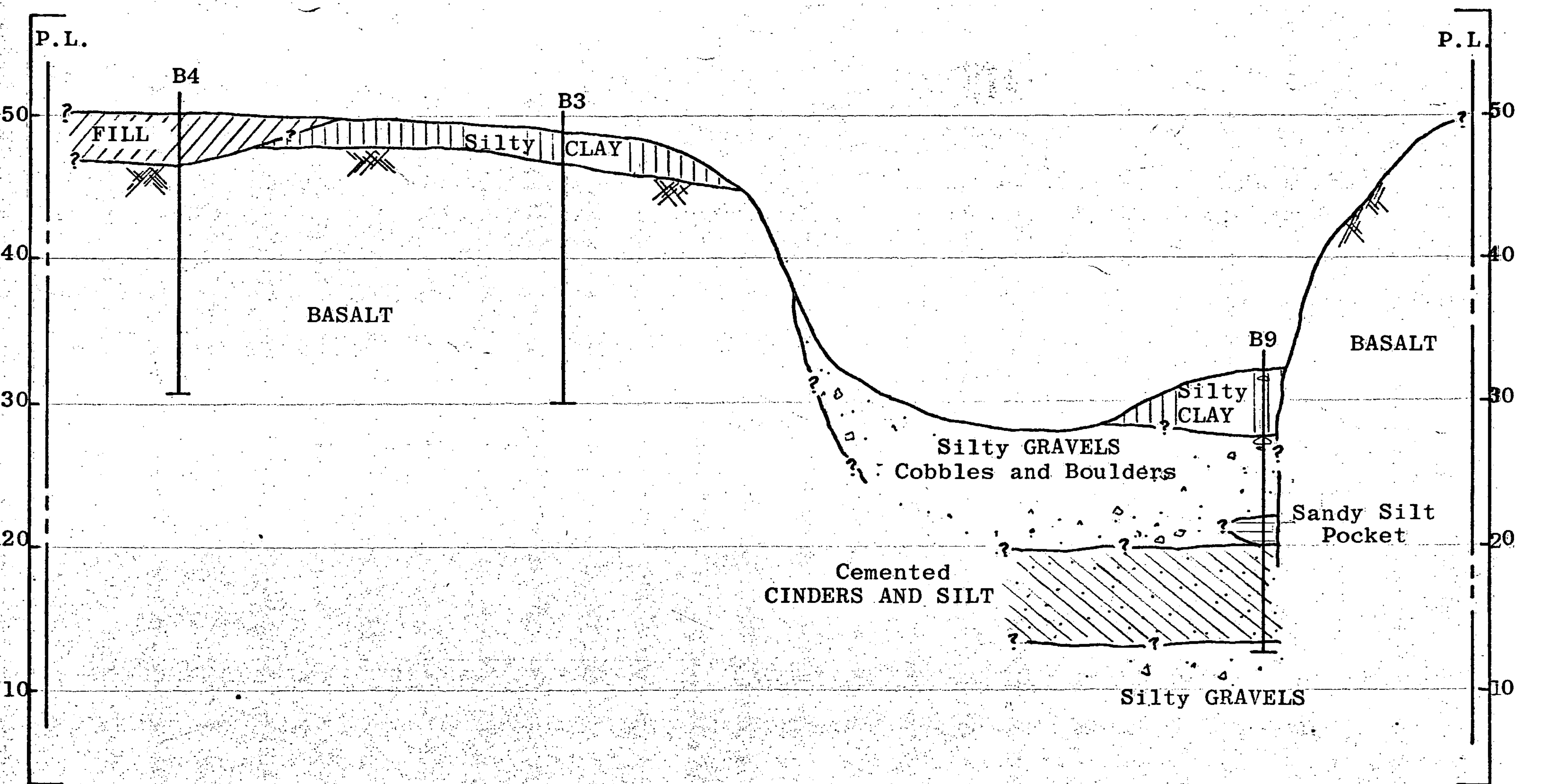


Type of Specimen Undisturbed		Before Test		After Test	
Diam 2.40 in.	Ht 1.0 in.	Water Content, w_o	56.4 %	w_f	61.4 %
Overburden Pressure, p_o T/sq ft		Void Ratio, e_o		e_f	
Preconsol. Pressure, p_c T/sq ft		Saturation, S_o	%	S_f	%
Compression Index, C_c		Dry Density, γ_d	67.0 lb/ft^3		
Classification CH		k_{20} at e_o = × 10$^-$ cm/sec			
LL	G_s	Project Mala Ekena Project			
PL	D_{10}	Amfac Financial Corp.			
Remarks Water added at 350 PSF		Area W. O. 287			
		Boring No. B8		Sample No.	
		Depth El 2'		Date 1-16-75	
		CONSOLIDATION TEST REPORT			

ENG FORM 1 MAY 63 2090

Plate B

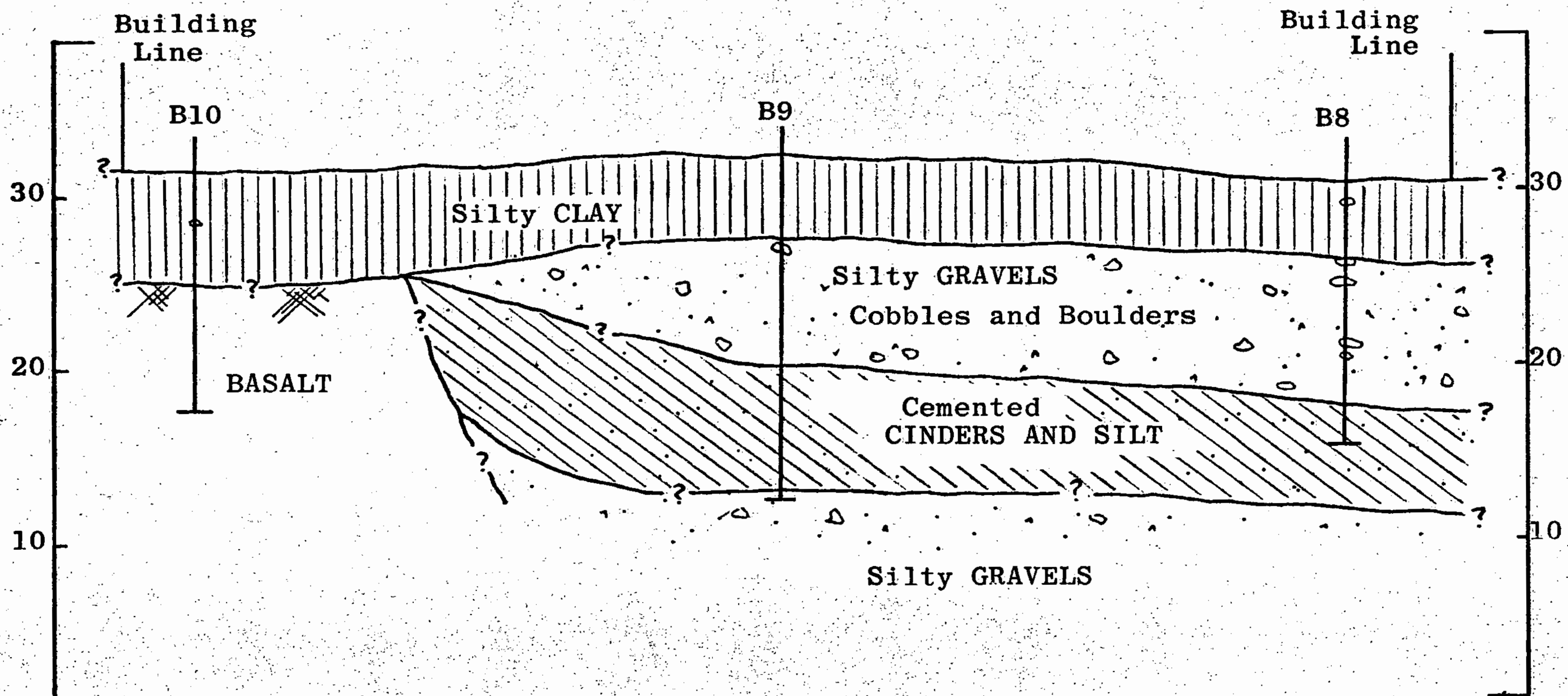


CROSS-SECTION A-A

Scale: Vert. 1" = 10'
Horiz. 1" = 20'

W. O. 287

Plate 1



CROSS-SECTION B-B

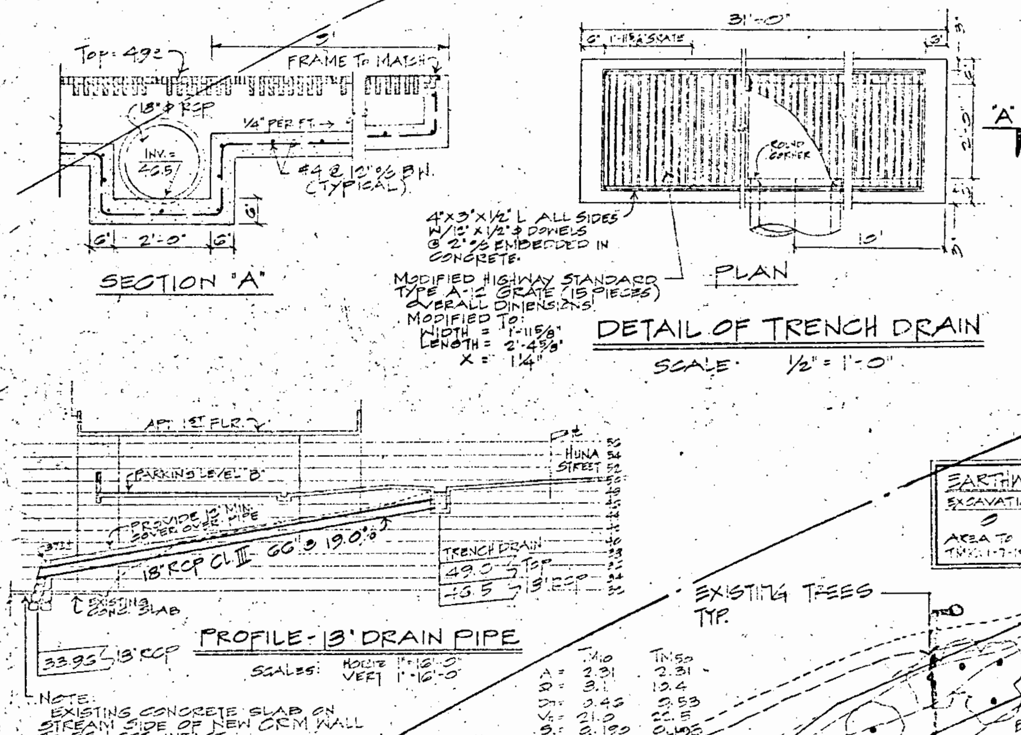
Scale: Vert. 1" = 10'
Horiz. 1" = 20'

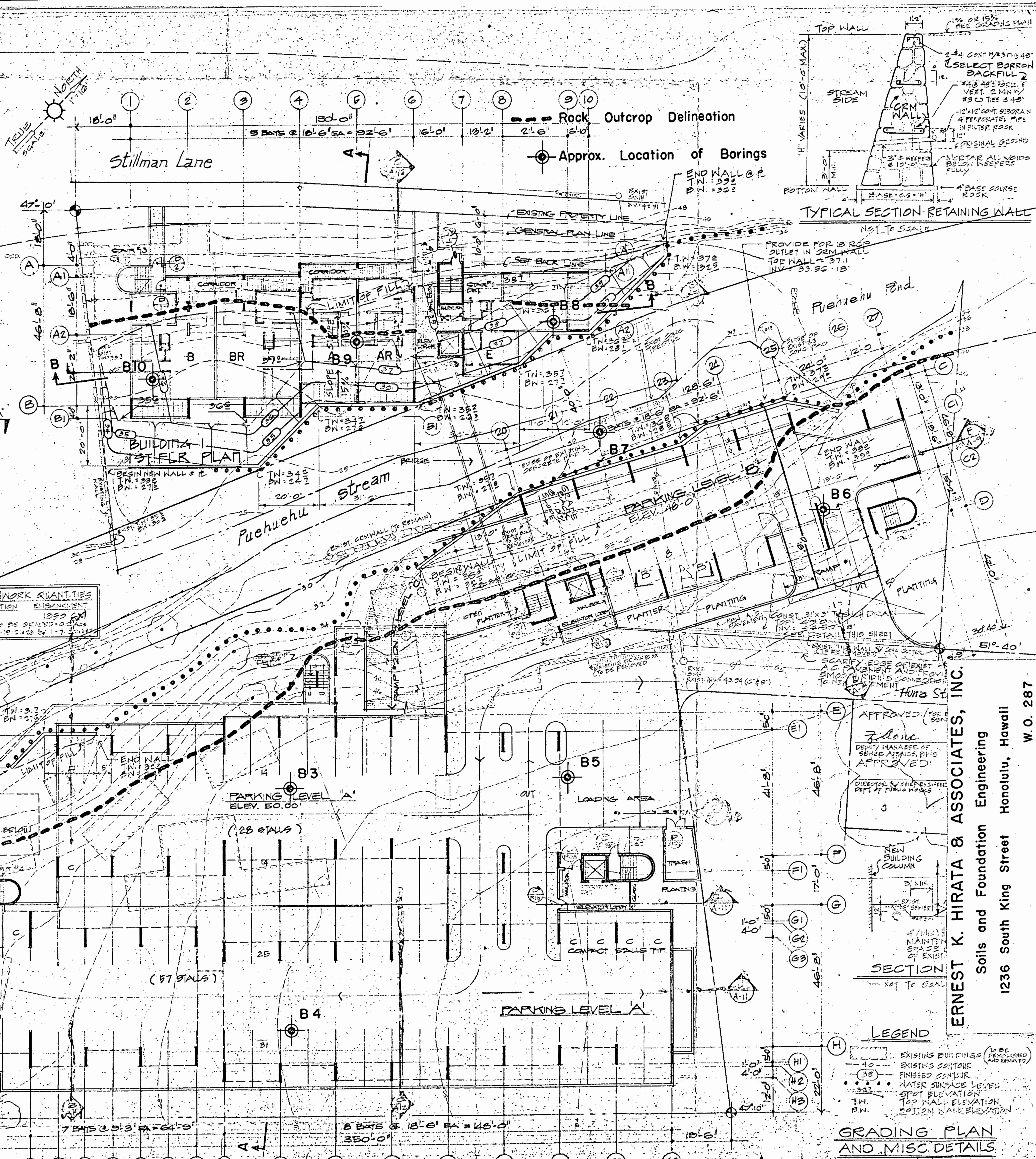
W. O. 287

Plate 2

GRADING NOTES:

1. ALL GRADING WORK SHALL CONFORM TO CHAP. 23, REVISED ORDINANCES OF HONOLULU 1969 (AS AMENDED, ORD. No. 3969) AND THE SOILS REPORT FOR THIS PROJECT BY WALTER LUM ASSOCIATES INC. DATED APRIL 17, 1974.
2. ALL SLOPE BANKS SHALL BE 2:1 UNLESS OTHERWISE NOTED. ALL SLOPES & EXPOSED AREAS SHALL BE SODDED OR PLANTED UNLESS OTHERWISE NOTED. PLANTING SHALL COMMENCE IMMEDIATELY FOLLOWING THE GRADING WORK.
3. FILL ON SLOPES STEEPER THAN 5:1 SHALL BE KEYED.
4. THE CONTRACTOR AND/OR DEVELOPER SHALL BE RESPONSIBLE FOR THE CLEANING & REMOVAL OF ALL SILT AND DEBRIS GENERATED, DEPOSITED & ACCUMULATED WITHIN DOWNSTREAM WATERWAYS, DITCHES, DRAIN PIPES & ON PUBLIC ROADWAYS & OTHER AREAS. THE CONTRACTOR AND/OR DEVELOPER AGREES TO REIMBURSE THE CITY & COUNTY OF HONOLULU FOR ALL COSTS EXPENDED IN THE ABOVE WORK IF REQUIRED FOR PUBLIC HEALTH & SAFETY OR MADE NECESSARY BY NON-PERFORMANCE BY THE CONTRACTOR AND/OR DEVELOPER.
5. THE CONTRACTOR, AT HIS OWN EXPENSE, SHALL KEEP THE PROJECT & SURROUNDING AREA FREE FROM DUST NUISANCE. THE WORK SHALL BE IN CONFORMANCE WITH THE AIR POLLUTION CONTROL STANDARDS & REGULATIONS OF THE STATE DEPARTMENT OF HEALTH.
6. THE CONTRACTOR AND/OR DEVELOPER SHALL COMPLY WITH THE PROVISIONS OF CHAP. 37, WATER POLLUTION CONTROL & CHAP. 37-A, WATER QUALITY STANDARDS, PUBLIC HEALTH REGULATIONS, STATE DEPT. OF HEALTH, DURING ALL PHASES OF WORK. ADEQUATE MEASURES SHALL BE TAKEN TO COMPLY WITH THESE REGULATIONS.
7. ALL EXIST. UTILITIES, WHETHER OR NOT SHOWN ON THE PLANS, SHALL BE PROTECTED AT ALL TIMES UNLESS OTHERWISE NOTED.
8. THE CITY SHALL BE INFORMED OF THE LOCATION OF THE BORROW SITE FOR THE BORROW REQUIRED FOR THIS PROJECT WHEN THE APPLICATION FOR A GRADING PERMIT IS MADE. THE BORROW SITE MUST ALSO FULFILL THE REQUIREMENTS OF THE GRADING ORD.
9. NO FILL MATERIAL SHALL BE PLACED, SPREAD OR ROLLED DURING UNFAVORABLE WEATHER CONDITIONS. WHEN THE WORK IS INTERRUPTED BY HEAVY RAIN, FILL OPERATION SHALL NOT BE RESUMED UNTIL FIELD TESTS BY THE SOILS ENG'R. INDICATE THAT THE MOISTURE CONTENT AND DENSITY OF THE FILL ARE AS PREVIOUSLY SPECIFIED.
10. PRIOR TO THE ISSUANCE OF A GRADING PERMIT, THE PERMITTEE SHALL OBTAIN A CERTIFICATION BY THE STATE DEPT. OF HEALTH ON THE ACCEPTABILITY OF THE PROPOSED EROSION CONTROL.
11. NO GRADING WORK SHALL BE DONE ON SATURDAYS, SUNDAYS, & HOLIDAYS AT ANY TIME WITHOUT PRIOR NOTICE TO THE CHIEF ENGR.
12. THE LIMITS OF THE GRADED AREA SHALL BE FLAGGED BEFORE COMMENCEMENT OF THE GRADING WORK.
13. TEMPORARY EROSION CONTROL PROCEDURES SHALL BE SUBMITTED PRIOR TO APPLICATION FOR A GRADING PERMIT.





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GRADING PLAN AND MISC. DETAILS

SHEET NO. C-1